McNeel, S, and R. Kreutzer (1999). Bioaerosols and Green-Waste Composting in California, California Department of Health Services, Environmental Health Investigations Branch.

INTRODUCTION

This report is issued to complement information provided in the California Integrated Waste Management Board (CIWMB) Local Enforcement Agency (LEA) Advisory No. 6, December 16, 1993 and Technical Bulletin No. 1, "Aspergillus, Aspergillosis, and Compositing Operations in California". This report was prepared in response to the following situations:

- Entrepeneurs are planning and building more green-waste composting facilities to implement mandated solid waste diversion goals stated in the Integrated Waste Management Act of 1989. As of March 1998, there were 78 operational green-waste composting sites in California, (CIWMB, 1998).

- Residents are concerned about the potential health effects of Aspergillus fumigatus and other bioaerosols from composting facilities.

- LEA's and local government officials have increased responsibility for siting and declarations of safety under the California Environmental Quality Act due to revision of the Integrated Waste Management Board Composting Operations Regulatory Requirements in July, 1995.

A panel of international experts on bioaerosols, risk assessment and composting was recently assembled to consider whether bioaerosols associated with the operation of biosolids or solid waste composting facilities endanger the health and welfare of the general public and the environment (Millner, et al, 1994). This group did not find epidemiological evidence to support increased risk of allergic, asthmatic or acute or chronic respiratory disease in the general public at or around the several open air and one enclosed composting sites that were evaluated. The major basis for this conclusion was the fact that workers were regarded as the most exposed part of the community and where worker health was studied, no significant adverse health impacts were found. However, this group also recognized that data regarding levels of bioaerosols exposure are incomplete and that there may be subpopulations within the general population that are at increased risk due to preexisting medical/immunological or genetic conditions. It was also the consensus of the participants that additional research be conducted to more clearly define the nature and health impacts of bioaerosols from composting facilities compared with all other environmental sources.

Odor issues have been the most frequent public concern associated with composting operations in the past. Recently, some groups have posed questions about possible health effects associated with airborne dust from nearby composting sites. It is important to keep in mind that many different activities generate organic dusts. Handling cereal grains, wood, hay, cotton, wool and

compost all produce airborne materials of animal, vegetable or microbial origin. This report examines the potential health effects of microbial constituents of airborne organic dust from composting of green-waste (i.e., yard trimmings). The term, "bioaerosols", as used in this report includes microbes such as bacteria and fungi, as well as any of their cellular components or metabolic by-products. Where bioaerosol data specific to green-waste composting was not available, references to other feedstock types were used.

Both outdoor and indoor air in the natural environment contain all of the microorganisms, in variable amounts, that are associated with composting. A large variety of microorganisms can be present in the initial feedstock, depending on the specific materials used. Many of the organisms will be destroyed due to the heat of the composting process. However, the catalogue of organisms that can be present at any stage of a yard refuse composting process is quite long. Table 1 lists some of the most important agents that may be of health concern.